

The Garden Problem

Twenty-five feet of fence is to be put around a garden. The plans have one edge of the garden to be along the side of a house, with the fence enclosing the other three sides of a rectangle.

1. Draw a figure that illustrates the problem.

2. If the width of the garden is the side perpendicular to the house, and the length of the garden is the side parallel to the house, fill in the chart below to show how the length and the area of the garden relate to the width of the garden.

Width (ft)	1	3	5	7	9	11
Length (ft)						
Area (ft ²)						

3. On your calculator, create a scatterplot that shows the relationship between the width of the garden and the area of the garden.

4. If the width of the garden is x feet, write a function $A(x)$ which represents the area of the garden as a function of the width.

$$A(x) = \underline{\hspace{2cm}}$$

5. Check your function by graphing it on your calculator.

6. We would like to find the exact dimensions of the garden that will maximize the area. We can do this analytically because we know the x -intercepts of the parabola! Find the width and length of the garden that would maximize the area. Then check your answers graphically.

Width: _____ Length: _____ Maximum Area: _____

7. What should be the dimensions of the garden if it is decided that the area enclosed should be sixty square feet? Solve algebraically, and check your answers graphically. (Round answers to one decimal place.

Width: _____ Length: _____